



## Technical and Sales Proposal Training UT

**Date:** June 5<sup>th</sup>, 2020

**Designated Persons:** NDT technicians from the Aerospace industry (manufacturing and maintenance)

**Purpose :** Training in **ULTRASONICS level 2** during **40 hours** according to **EN4179 requirements**

Mrs., Mr.,

According to your request, we can offer the training detailed on the next page with the below conditions.

If you give your agreement for this proposal, please return the part on page 2 completed and signed.

MPP offers this training in its office with respect of the sanitary recommendations.

We are available for any complementary information you may need.

**Your contacts :**

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Regards,

JC Montanier  
Sales director

1) Proposal

<u>Title</u> : Training Ultrasonics level 2 according to EN4179	<u>Durée</u> : 5 days, either 40 hours
<u>Training reference</u> : <b>2020UT01E</b>	<u>Training location</u> : <i>Parc Industriel des Hauts Sarts 1<sup>ère</sup> avenue, 66 4040 Herstal - Belgique</i>
<u>Trainer</u> : Mr Pierre Servais Doctor in Sciences NDT, level 3 UT	<u>Dates</u> : From Monday June 15th to Thursday 19th, 2020
<u>Offer date</u> : June 5th, 2020	<u>Language</u> : <i>English</i>
<u>Room</u> : main training room	<u>Time</u> : From 08h30 to 16h30

**Please fill below**

Total number of participant : .....	<u>Split</u> : • ..... worker(s) • ..... employee(s) • ..... manager(s)
<u>Name</u> :	<u>Company</u> :
<u>First name</u> :	<u>Company stamp or signature and name of responsible</u>
<u>Position</u> :	
<u>Date</u> :	

## Training details : ULTRASONICS 40 HEURES

### **1. Introduction**

#### **1.1 Presentation of the END**

#### **1.2 Inspection historic**

#### **1.3 Terminology, definitions**

### **2. Physicals principals**

#### **2.1 Useful specifications**

#### **2.2 Physical and Mathematica reminders**

Sinusoidal movement, amplitude, period, frequency, wave length, propagation speed, propagation phenomena

#### **2.3 Waves types**

- Longitudinal waves
- Transversal waves
- Rayleigh and Lamb waves

#### **2.4 Reflection et refraction**

- Incidence, transmission and normal reflection, acoustic impedance, reflection coefficient and transmission, acoustic pressure
- Oblique Incidence
- Snell/Descartes laws
- Critical angles, conversion mode

#### **2.5 Emission et reception of ultrasonic waves**

- Piezo-electric waves
- Ferroelectricity or electrostriction
- Magnetostriction

#### **2.6 Transducer characteristics : material, dimensions, piezoelectric constants**

#### **2.7 Circular or rectangular transducer Beam characteristics**

- Frequency and transducer dimensions influence
- Close field (Fresnel area)
- Far field (Fraunhofer area)
- Beam divergency
- Beam shape, divergency factor

### **3. Products and associated test technics knowledge**

Defect resulting from manufacturing process and defects from the conditions

#### **3.1 Use of testing technics base on products and discontinuity expected**

#### **3.2 Geometry and structure influence (echoes parasites, attenuation)**

#### **3.3 Transducer choice base on required resolution and noise reduction (type, frequency, size)**

#### **3.4 Special technics and C-Scan cartography**

- Immersion
- TOFD
- Phased array

#### **3.5 Main parameters influence**

### **4. Inspection equipment**

#### **4.1 Types of traductors and their technologies**

#### **4.2 The ultrasonic equipment (analogic – numeric) (detailed knowledge of the functions)**

- Emission
- Reception and amplification (percentage and dB)
- Time base
- Visualizations type A, type B et type C
- Annexes Functions
- Automatic or semi-automatic systems

#### **4.3 Coupling environment**

#### **4.4 Reference and transfer blocs**

### **5. Information prior to testing**

#### **5.1 Instructions, procedures and norms content and prescriptions**

#### **5.2 Preparation and writing of instruction for agent level 1**

### **6. Inspection applications and technics**

#### **6.1 Equipment verification according to EN 12668-3**

#### **6.2 Technics by contact (reflection, transmission)**

#### **6.3 Technics par immersion**

#### **6.4 Set-up of time base and sensibility**

- Reflectors reference (distance and size laws)
- Transfer correction (surface and attenuation)
- Method DGS (AVG)
- Curves DAC (CAD) (distance/amplitude correction)

#### **6.5 Principals and limits of dimensioning technics**

#### **6.6 Scanning Schema**

#### **6.7 Thickness measurements**

- Equipment
- Technics